

## CLAIMS

1. A method of activating an organic coating to enhance adhesion of the coating to a further coating and/or to other entities comprising applying a solvent and an adhesion promoter selected from linear and branched polyethylene imines (PEI); amine, epoxy, isocyanate and/or hydroxyl terminated polyether glycols; dendrimers; low molecular weight amines; trimethoxysilyl(propyl) diethylenetriamine; epoxysilicones; glycidylethers; aziridines and acids or combinations thereof; at least two aminosilanes; combinations of aminosilanes with linear and branched polyethylene imines (PEI); amine, epoxy, isocyanate and/or hydroxyl terminated polyether glycols; dendrimers; low molecular weight amines; epoxysilicones; glycidylethers; or aziridines and acids to a surface of the organic coating, wherein contact of the organic coating with the solvent or the solvent and adhesion promoter combination results in swelling of the organic coating.
2. A method according to claim 1, in which the adhesion promoter is a compound having at least one functional group.
3. A method according to claim 2, in which the adhesion promoter is a compound having two or more functional groups which are of the same or different functionality.
4. A method according to claim 2 or claim 3, in which the functional group is nucleophilic.
5. A method according to claim 4, in which the functional group is selected from amine, alcohol, carboxylic acid, amine, ester, thiol, ether, epoxy, isocyanate, isothiocyanate and anhydride groups.
6. A method according to claim 5, in which the functional group is an amine and/or alcohol group.
7. A method according to claim 1, in which the amine, epoxy, isocyanate and/or hydroxyl terminated

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polyether glycols are selected from polyethylene glycol, polypropylene glycol and polyethylene oxide.

8. A method according to claim 1, in which the dendrimers are selected from polypropylene imine octamine 5 dendrimer and polypropylene imine tetraamine dendrimer.

9. A method according to claim 1, in which the low molecular weight amines are selected from ethylene diamine, diethylene tetraamine, triethylene tetraamine (TETA), tetraethylene pentamine, pentaethylene hexamine, 10 piperazine, aminoethylpiperazine, 1,4-bis(3-aminopropyl)piperazine, N,N'-bis(3-aminopropyl)ethylenediamine, 4,9-dioxa-1,12-dodecanediamine, 2,2'-(ethyleneoxy)bis(ethylamine), 4,7,10-trioxatridecane-1,13-diamine (TODA), 4,7-15 dioxadecane-1,10-diamine (DODA), polyetheramine T 403, N,N-bis (3-aminopropyl)-ethylene diamine, 3-2(2-aminoethyl)aminopropyl amine, dipropyltriamine and 4,4'diamino-dicyclohexylamine.

10. A method according to claim 9, in which the low 20 molecular weight amine are selected from TODA and DODA.

11. A method according to claim 1, in which the aminosilane is trimethoxysilyl (propyl)diethylenetriamine.

12. A method according to claim 1, in which the 25 glycidylethers are selected from trimethanolpropane triglycidylether and polyethylene glycol digcidyl ethers.

13. A method according to claim 1, in which the aziridine is trimethylolpropanetris (3-aziridino propionate).

14. A method according to claim 1, in which the acid 30 is polyethylene glycoldicarboxylic acid.

15. A method according to claim 1, in which the adhesion promoter has a molecular weight less than about 100,000.

16. A method according to claim 15, in which the 35 adhesion promoter has a molecular weight less than about 10,000.

17. A method according to claim 1, in which two or more adhesion promoters are present.

18. A method according to claim 17, in which high and low molecular weight adhesion promoters are present.

5 19. A method according to claim 18, in which the high and low molecular weight adhesion promoters are high and low molecular weight polyether glycols.

10 20. A method according to claim 19, in which the high and low molecular weight polyether glycols are 4,9-dioxa-1, 12-dodecane diamine and polypropylene glycol, respectively.

15 21. A method according to claim 17, in which the adhesion promoter is a combination of aminosilane and epoxy compounds; 4, 7, 10-trioxatridecone-1, 13-diamine and epoxy silanes; aziridines and trimethylolpropanetris (3-aziridino propionate); aziridine and acids; or aziridine and glycols.

20 22. A method according to claim 1, in which the adhesion promoter is present in an amount more than about 0.01% based on the total weight of the combination of solvent and adhesion promoter.

25 23. A method according to claim 1, in which the adhesion promoter is present in an amount of about 1% to about 50% based on the total weight of the combination of solvent and adhesion promoter.

24. A method according to claim 1, in which the solvent is an organic solvent.

30 25. A method according to claim 24, in which the organic solvent is selected from ester based solvents, ketones, alcohols, ethers, amides, aromatics and halogenated solvents.

35 26. A method according to claim 25, in which the solvent is selected from ethyl acetate, isopropyl acetate, tertiary butyl acetate, glycoether acetates based on ethyleneglycol and propylene glycol repeat units, methyl amyl ketone, methyl isoamyl ketone, benzyl alcohol,

isopropylalcohol, glycoldiethers, N-methyl pyrrolidinone, dichloromethane and dichloroethylene.

27. A method according to claim 25 in which the solvent is a combination of N-methyl pyrrolidinone and 5 ethyl acetate; dichloromethane and benzyl alcohol; ethyl acetate and benzyl alcohol; ethyl acetate and diglycol ether dimethyl ether; or isopropylalcohol and ethoxyethylacetate.

28. A method according to claim 1, in which the 10 solvent is present in an amount less than about 99.9% based on the total weight of the combination of solvent and adhesion promoter.

29. A method according to claim 28, in which the 15 solvent is present in an amount of about 50 to about 99.9% based on the total weight of the combination of solvent and adhesion promoter.

30. A method according to claim 1, in which an additive is also applied to the organic coating.

31. A method according to claim 30, in which the 20 additive is selected from rheology modifiers, film formers, wetting agents, surfactants, dispersants, substrate cling agents, anti-foaming agents, anti-corrosion reagents, stabilizers, leveling agents, pigments and dyes.

25 32. A method according to claim 30, in which the additive is present in an amount of less than about 10% based on the total weight of the combination of solvent, adhesion promoter and additive.

33. A method according to claim 1 or claim 30, in 30 which the solvent, adhesion promoter and additive are applied either simultaneously, sequentially or separately.

34. A method according to claim 1 or claim 30, in which the solvent, adhesion promoter and additive are 35 applied simultaneously in the form of an activation treatment.

35. A method according to claim 1 or claim 30, in which the solvent, adhesion promoter and additive are

applied via a spray, brush, dip, knife, blade, hose, roller, wipe, curtain, flood, flow, mist, pipette or combinations thereof.

36. A method according to claim 1, in which the  
5 organic coating is a polyurethane, epoxy, polyester, polycarbonate and/or acrylic coating.

37. A method according to claim 1, in which the other entities are selected from adhesives, sealants, pressure sensitive decals and logos.

10 38. A method according to claim 1, in which excess solvent and/or adhesion promoter is removed by solvent or water rinsing; dry, water or solvent wiping; air or gas knife; vacuum application; squeegee; and/or natural or forced convection evaporation.

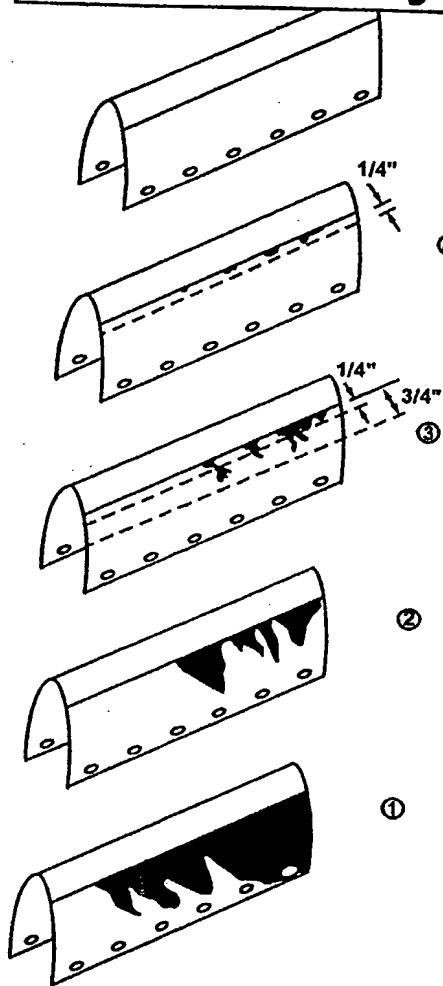
15 39. A coated substrate having an activated organic coating, wherein the adhesion of the activated coating to a further coating and/or other entities has been enhanced by application of a solvent and an adhesion promoter selected from linear and branched polyethylene imines (PEI); amine, epoxy, isocyanate and/or hydroxyl terminated polyether glycols; dendrimers; low molecular weight amines; trimethoxysilyl(propyl) diethylenetriamine; epoxysilicones; glycidylethers; aziridines and acids or combinations thereof; at least two aminosilanes; 20 combinations of aminosilanes with linear and branched polyethylene imines (PEI); amine, epoxy, isocyanate and/or hydroxyl terminated polyether glycols; dendrimers; low molecular weight amines; epoxysilicones; glycidylethers; or aziridines and acids to the surface of the activated 25 coating such that contact of the organic coating with the solvent or the solvent and adhesion promoter combination results in swelling of the organic coating.

30 40. A coated substrate according to claim 39, in which the substrate is a metal, composite or a material containing plastics, glass, wood or fabric.

35 41. An activation treatment for an organic coating to enhance adhesion of the coating to a further coating

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**Topside Only of Foil is Rated (5 to 0)**



- ⑤ 5: 0 to 1/16" Tear
- 4.5: 1/16 to 1/8" Tear
- ④ 4: 1/8 to 1/4" Tear
- 3.5: 1/4 to 1/2" Tear
- 3: 1/2 to 3/4" Tear
- 2: 15 to 33% Removed
- 1.5: 33 to 50% Removed
- 1: 50 to 70% Removed
- 0.5: 70 to 90% Removed

All views and ratings are of  
the top and outboard surface.

**FIGURE 2**

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